

Abstract of the Disclosure

Techniques are provided for performing active interferometric signal analysis in software. The techniques exploit expressor functions designed to extract spectral invariants of events of interest associated with an arrayed platform device used to detect the signal pattern to be analyzed. Various techniques for generating expressor functions are also provided. Depending upon the implementation, the techniques provide for both detection and quantitation analysis by exploiting either constructive or destructive interferometric analysis using reverberant convergence to detect resonance events. The techniques achieve software emulation of wave-particle interactions and wave-wave interactions and can operate in either the frequency domain or the phase domain. The techniques may be used for analyzing static spatial systems, static data from arrayed measurement platforms, dynamical systems, spatio-temporal systems or plasma systems.